ABSTRACT OF THE DISCLOSURE

A computer system employs a hierarchical ring structure
for communication. Computer system elements are configured
into modules with ring interface hardware, and the modules
are coupled to one or more rings. Bridge modules may be
included for transmitting between rings in the hierarchy.
The rings are time division multiplexed, and each time slot
on a ring carries a frame. According to an address carried
within the frame, bridge modules determine whether or not to
transmit a frame circulating on a source ring onto a target
ring. If the address of the frame indicates a module upon
the source ring, the bridge module retransmits the frame on
the source ring. Otherwise, the bridge module transmits the
frame on the target ring. The bridge module operates in
this fashion at any level of the hierarchy. The owner of a
time slot on a ring is permitted to release the time slot
for use by other modules. To reclaim a time slot, the owner
marks the time slot owned. The module using the time slot,
upon detecting the owned mark, removes the frame from the
time slot and responds with a null frame. If a module
detects a frame to which that module is to respond but the
module's buffer is full, the module may retransmit the frame
upon the source ring. The time slot carrying the frame.
effectively serves as a queue position. According to one
embodiment, rings comprise optical links.

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